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VASO-TONIC CENTRES IN THE THALAMI.

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THE relation of the base of the brain to the main vaso-motor centre is an obscure territory. Danilewsky was the first to make a study of this subject. He found that irritation of the caudate nucleus as well as the lenticular caused a very marked change in the blood-pressure. By a weak irritation the arterial tension increased and the pulse was slowed, the individual pulse waves being greater. By stronger irritation the same result ensued, although in a more rapid manner. If the vagi and sympathetics are cut in the neck, then irritation of the striate bodies must be much greater to cause an increase in the blood-pressure. He admits that this may be due to diffusion of the current to the peduncles, which causes a rise of pressure. Removal of the brain anterior to the medulla shows a decrease of blood-pressure. Roy, in an article upon the blood supply of the brain, concludes that the chemical products of cerebral metabolism contained in the lymph which bathes the walls of the arterioles of the brain can cause variations of the calibre of the cerebral ~~vessels; that~~ in this reaction the brain possesses an intrinsic mechanism by which its vascular supply can be varied locally in correspondence with local variations of functional activity. This view excludes the idea of any vaso-motor centre peculiar to the brain itself. Drs. Podanowsky and Popoff* have made a study of the action of antipyretics and found when the brain was divided behind the corpora striata the temperature of the skin showed no change, although the temperature of the skin could be raised by irritation of the respiratory centre by choking the animal. In the normal animal the temperature of the skin was elevated by the antipyretics. Hence they infer that an especial vaso-motor centre exists in the anterior part of the brain. My experiments were made upon etherized rabbits. The animal was bound down with his carotid attached to the kymographion, the skull having been previously trephined. To cause lesions in the basal ganglia, the "seeker" was thrust down to the base of the brain either with or without the presence of the cortex. After the lesion the pulse and arterial tension were noted. Punctures into the corpora striata or the space between them and the thalami cause no special fall of tension, but often rises. No constant effect was noted. When, however, the anterior half of the thalami was thrust into, then the pressure nearly always fell, never to rise again to the original height, although the pulsations were about the same in number. Fig. I. shows the effect of such a puncture. The arrow represents the time of the lesion, the dotted line the pulse, and the continuous line the arterial tension. The binding down did not cause this fall, as the effect of detention does not ensue in the first hour, which was about the time the observation was continued. The rate or the depth of the respirations was not perceptibly altered and did not influence the arterial tension. In other etherized rabbits the cortex was scooped out so that basal ganglia could be recognized. They were then punctured and the same result ensued when the thalami were wounded.

The effect of faradic irritation was tried upon the exposed basal ganglia.

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* *Wiener med. Presse*, Dec., 1890.

Irritation of the striate bodies caused a slow rise, while that of the thalami was followed by a more rapid rise. But these irritations are not to be absolutely trusted, as spreading of the current can readily take place. These facts indicate that the thalami have an influence upon the vaso-motor system. I believe this action to be of a tonic nature, as

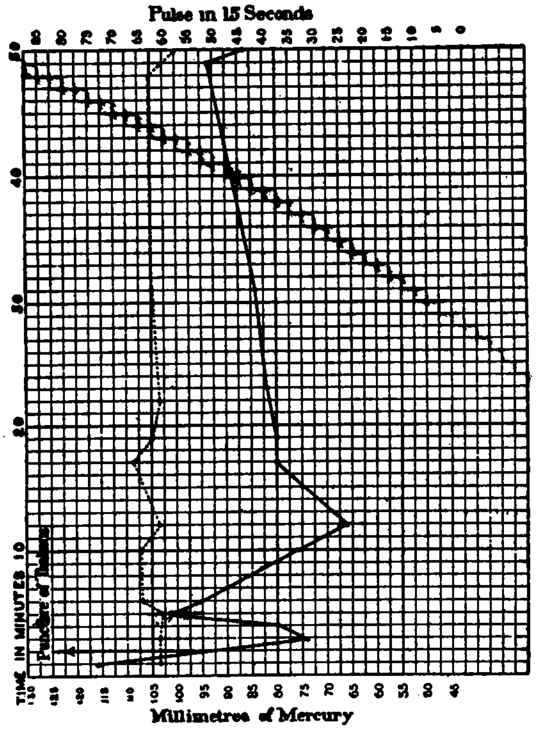

FIG. I.

section just in front of the pons causes a fall of tension. That impulses set up by peripheral irritations reach the medullary centres by traveling around the gray matter about the anterior end of the third ventricle is shown by the experiment where heat is applied to the peripheral nerves to influence the respiratory centre through the thermo-polypnœic. I have in another place shown that the sphincters stand in a reflex relation to the thalami and head of crura cerebræ. Hence it is quite probable that certain peripheral nerves stand in a reflex relation to vaso-tonic centres in the thalami, which have a tonic effect upon the medullary monarchical vaso-motor centre.

The preceding results are based upon forty experiments. As I do not wish to burden the JOURNAL, I give a few examples.

EXPERIMENT I.—RABBIT, CORTEX ON.

P.M.	Pulse for 15 seconds.	Pressure.
4.30.	51	64
4.30.15.	Section through anterior ends of thalami.	
4.30.30.	51	42
4.31.	52	46
4.32.	52	46
4.33.	50	46
4.34.	53	46
4.46.	51	58
5.15.	55	46

EXPERIMENT II.—RABBIT, CORTEX ON.

P.M.	Pulse.	Pressure.
4.25.	53	90
4.25.15.	Section through anterior ends of thalami.	
4.26.	44	76
4.26.15.	53	76
4.26.45.	57	76
4.33.	57	90
4.35.	60	84
4.41.	60	70
4.46.	61	70
4.46.30.	62	68
5.26.	60	76

EXPERIMENT III.—RABBIT, CORTEX ON.

P.M.	Pulse.	Pressure.
4.30.	74	90
4.31.	Section through the anterior ends of optic thalami.	
4.32.	75	76
4.33.	70	76
4.34.	75	68
4.36.	73	66
4.42.	70	70
4.49.	75	74
4.55.	80	94
5.16.	81	90
5.30.	80	90

EXPERIMENT IV.—RABBIT, CORTEX ON.

P.M.	Pulse.	Pressure.
4.18.	62	116
4.18.15.	Section through anterior ends of thalami.	
4.18.30	62	74
4.19.30	59	80
4.20	64	104
4.21	65	96
4.26.	63	78
4.28.	62	66
4.33	67	80
4.35	61	80
4.39	63	84
4.47	63	84
5.15	60	94
5.17	60	88

EXPERIMENT V.—RABBIT, CORTEX REMOVED

P.M.	Pulse.	Pressure.
4	73	110
4.01.	Section of left anterior end of thalamus not injuring the crura.	
4.01.15	74	104
4.02	78	102
4.04	73	104
4.15	66	106
4.34	52	101
4.45.	52	82

EXPERIMENT VI.—RABBIT, CORTEX REMOVED.

P.M.	Pulse.	Pressure.
4.30	67	94
4.30.15.	Section transversely through the middle of the thalami.	
4.30.45	70	85
4.32.	60	90
4.33	56	94
5.07	64	76
5.17.15	67	76
5.20	66	77

EXPERIMENT VII.—RABBIT, CORTEX ON.

P.M.	Pulse.	Pressure.
4.23	68	110
4.23.15.	Anterior ends of corpora striata cut.	
4.23.30	70	104
4.24	62	110
4.25	69	110

4.27	70	110
4.30	65	116
4.37	65	120
4.41	68	120
4.46	63	120
5.18	60	100

EXPERIMENT VIII.—RABBIT, CORTEX ON.

P.M.	Pulse.	Pressure.
4.36	52	100
4.36.15.	Puncture into the space between corpora striata and optic thalami.	
4.36.30	56	102
4.37	54	102
4.38	56	102
4.40	65	96
4.46	70	90
4.54	73	84
5.17	68	92

ANATOMICAL RELATIONS OF THE CEREBRAL ARTERIES.

The Neurologisches Centralblatt of March 1st, 1890, gives a summary of a recent work of Alessandro Tedeschi on the above subject.

Tedeschi made numerous injective experiments on men and animals (sheep and calves). Apart from some individual differences in the branching of the vessels, the following are his conclusions:

1. The arteries of the cortex of the brain are not terminal arteries; hence we cannot speak of definite vessel-territories in the cerebral cortex.
2. The cortical arteries of the cerebrum anastomose with the cortical arteries of the cerebellum.
3. The arteries of the base of the brain communicate with those of the cortex.
4. There are anastomoses between the arteries of the two sides, both in the cortex, and at the base of the brain, especially in the latter region.
5. The arteries communicate with the veins, not only by means of the capillaries, but also directly, and thus communication is easily demonstrated both in the choroid plexus and in the brain substance.

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